Borodina M. M.

PHASE I BOOK EXPLOITATION SOV/3940

Moscow. Tsentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii. Institut pretsizionnykh splavov

Pretsizionnyye splavy (Precision Alloys) Moscow, Metallurgizdat, 1959. 268 p. (Series: Its: Sbornik trudov, vyp. 22) 2,150 copies printed.

Additional Sponsoring Agency: USSR. Gosudarstvennyy planovyy komitet

Ed.: D. I. Gabrielyan; Ed. of Publishing House: Ye. I. Levit; Tech. Ed.: P. G. Islent'yeva.

PURPOSE: This collection of articles is intended for technical personnel and scientific workers in the metallurgical, instrument-manufacturing, and electrical-equipment-manufacturing industries. It may also be useful to students of schools of higher technical education.

COVERAGE: This collection of articles presents the results of studies of precision alloys made in recent years by the Tsentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii (Central Scientific Research Institute of Ferrous Metallurgy). Properties of metal alloys which can be soldered (soft or hard) with glass and ceramic materials and alloys used for making springs are discussed. Anomalies of electrical resistance and thermal expansion and the effect of irradiation on properties of alloys are considered. Problems connected with the determination of magnetic susceptibility and with rolling of bimetallic stripes are reviewed. An analysis of alloys used in manufacturing high-temperature transducers and strain gages is presented. No personalities are mentioned. References follow several of the articles.

25

BORODINA, M. N.

Arsen'yev, V. A. and Borodina, M. N. "The settlements and quantity of the river beavers in the USSR," Okhrana prirody, 1948, No.4, p. 44-64 - Bibliog: 22 items

SO: U-3264, 1[illegible] April 1953, (Letopis 'Zhurnal 'nykh Statey, No.3, 1949)

BORODINA, M. N., Cand Biol Sci -- (diss) "Reacclimatization of the river beaver in the basin of Oka River and biological bases for the economic utilization thereof." Mos, 1957. 18 pp, incl cover. (Mos State Ped Inst im V. I. Lenin), 140 copies. (KL, 5-58, 115)

Borodina, Z. P.

MT

High-strength gypsum from local raw materials. Z. V. Khakimov and M. P. Borodina. *Trudy Inst. Khim., Kirgiz. Filiala Akad. Nauk S.S.S.R.* 1953, No. 5, 161-6; *Referat. Zhur., Khim.* 1954, No. 50403.—A high-strength product was obtained from Shamsin gypsum rock by steaming. Under lab. conditions this was obtained by autoclaving for 6 hrs. at 124-6° under 1.3 atm. M. Hoseh

(1)

LYAMPERT, I.M.; BORODIYUK, N.A.; AGABABOVA, E.R.; SHCHEGLOVA, A.S.; BOLOTINA, A.Yu.; YARESHKO, N.T.

Streptococcal antigens in patients with rheumatic fever at various stages of the disease. Zhur.mikrobiol., epid. i immun. 32 no.10: 58-64 O '61. (MIRA 14:10)

1. Iz Instituta epidemiologii i mikrobiologii im. Gamalei AMN SSSR, I Moskovskogo ordena Lenina meditsinskogo instituta im. I.M.Sechenova i Revmatologicheskogo kabineta Leningradskogo rayona, Moskva.
(RHEUMATIC FEVER) (STREPTOCOCCAL INFECTIONS)

BORODINA, M.A.

SADOVSKIY, V. D., BORODINA, M. A., IVANOVSKAYA, S. I.

Mechanical Properties of Alloy Steels with Isothermic and Step-Hardening.

Trudy IMM UFAN 5, 3, 1945.

BORODINA, N.N.

MALYSHEV, K. A.;IVANOVSKAYA, S. I.; BORODINA, N. A.

The Effect of Gases on the Growth of the Austenite Grain

Trudy IFM UFAN 10, 48, 1946

BORODINA, N. A.

IA 6/49T82

USSR/Metals Jul 48
Steel, Structural
Steel, Temper Brittleness

"New Type of Temper Brittleness," Prof V. D. Sadovskiy, Dr Mech Sci; N. A. Borodina, Engr; Inst Phys of Metals, Ukrainian Affiliate, Acad Sci, 6½ pp

"Stal'" No 7

Structural alloy steels, with complex system of austenite transformation, are not liable to usual temper brittleness which occurs after prolonged annealing at 500-650° or after slow cooling from such temperatures. After certain hardening treatments, they display new type of temper brittleness, 6/49T82

USSR/Metals (Contd) Jul 48

evidently due to residual austenite content. This decomposes only at comparatively high temperatures, causing sharp drop in resilience. Includes graphs. 6/49T82

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New type of temper brittleness. V. D. Sadovskii and N. A. Borodina. *Stal* 8, 612-18(1948).—A new type of temper brittleness was observed in structural steels having a complex austenite transformation. These steels are not susceptible to the ordinary temper brittleness that sets in on prolonged temper at 500-650° or upon slow cooling from such temps. This brittleness is occasioned by partial decompn. of austenite in the upper bainite region during hardening accompanied by a sharp increase in residual austenite. The decompn. of the residual austenite during subsequent temper induces this brittleness. The presence of Mo does not prevent this brittleness. M. Hosch

[redacted], P. N.

Sadovskiy, V. A., Rodigin, N. M., and Borodina, M. A. "The influence of structural variations in steel on phase change in electric heating", Vestnik mashinostroyeniya, 1948, No. 12, p. 12-14, - Bibliog: 6 items.

SO: U-2088, 12 Feb. 53, (Letopis' Zhurnal 'nykh Statey, No. 2, 1949).

BORODINA, N.A.

21759 SADOVSKIY, V.D. i BORODINA, N.A. Prokalivayemost' stali i yavleniya khrupkosti pri otpuske. V SB: Problemy konstruktsionnoy stali. M.L., 1949, S. 102-19 — Bibliogr: 8 Nazv.

SO: Letopis'Zhurnal'nykh Statey, No. 29, Moskva, 1949

DABOVSKIY, V. D., RODICHE, M. M., BORODINA, M. A.

Steel - Heat Treatment

Effect of structural non-uniformity of steel upon the phase transformations in heating by means of electricity. Trudy Inst. fiz. met. No. 13, 1951.

Monthly List of Russian Accessions, Library of Congress June 1953. UNCL.

BORODINA, N. A.

Category : USSR/Solid State Physics - Phase Transformation in Solid Bodies E-5

Abs Jour : Ref Zhur - Fizika, No 3, 1957, No 6621

Author : Malyshev, K.A., Borodina, N.A., Mirmel'shteyn, V.A.
Inst : Institute of Physics, of Metals, Ural Branch, Academy of Sciences, USSR
Title : Stabilization of Austenite at Temperatures Above the Martensitic Transformation Range

Orig Pub : Fiz. metallov i metallovedeniye, 1956, 2, No 2, 277-284

Abstract : Magnetometric investigations with two low-carbon (0.05%) Cr-Ni-Mn steels, having martensitic points at -10 and 80°, have established that stabilization and destabilization of austenite take place as a result of isothermal soaking of specimens of tje aistemotoc state at 300, 400, 500, 600° fpr pme tp 260 hours. Increasing the temperature and increasing the duration of the soaking in the above ranges superimposes a destabilization process on the stabilization process, and as a result the final effect is determined by the ratio of these two processes. The stabilization of austenite is also due to phase

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hardening and to the direct (cooling in liquid nitrogen) and reverse (heating to 750°) martensitic transformation. In this case the stabilization is accompanied by a substantial austenite strengthening, which can be used for practical purposes. Thus, the same phenomenon of austenite stabilization may be caused by two factors, which at first glance appear to be contradictory, one (the isothermal soakind above the martensitic point) leading to a reduction in the lattice distortion of the austenite and the second (phase hardening) leading to their increase.

Dorodnov N.A.

PHASE I BOOK EXPLOITATION SOV/3847
SOV/26-4-4-20

Akademiya nauk SSSR. Ural'skiy filial. Institut fiziki metallov

Trudy, vyp. 20 (Transactions of the Institute of the Physics of Metals, Ural Branch, Academy of Sciences USSR, No. 20) Sverdlovsk, 1958. 402 p. Errata slip inserted. 1,000 copies printed.

Resp. Eds.: S.V. Vonsovskiy, Corresponding Member, Academy of Sciences USSR, and V.I. Arkharov, Doctor of Technical Sciences.

PURPOSE: This book is intended for scientists working in the field of physical metallurgy.

COVERAGE: This is a collection of 28 articles written by members of the Institute of the Physics of Metals, Ural Branch of the Academy of Sciences USSR, on problems investigated at the Institute. Studies at the Institute have concentrated on two basic problems: 1) developing a theory of metals and alloys and finding ways to improve the properties of engineering materials; and 2) developing new physical methods for investigating and controlling the quality of materials and metal articles. In connection with these basic problems the articles in the collection treat the following subjects: problems of the multielectron quantum-mechanical theory of solids; the laws of distribution and diffusion of admixtures in various metallic alloys (internal adsorption theory); strength and plasticity of polycrystalline materials in relation to interatomic binding forces, distortions in the crystal lattice; structural theory of diffusion reaction, i.e. diffusion due to chemical reactions in solid phase; theory of the magnetic structure of ferromagnetic substances; theory of the heat treatment of steel; and the physical theory of magnetic measurements (magnetic flaw detection and structural analysis). The first article gives a description of the work being done by the Institute and a list of departments and laboratories along with their chief personnel. Several persons are cited for their work at the Institute. References accompany each article.

AVAILABLE: Library of Congress (TM607.A4)

Card 6/6

JA/gdw/lb
8-2-60

SOV/126-6-5-31/43

AUTHORS: Borodina, N.A., Malyshev, K.A. and Mirmel'shteyn, V.A.

TITLE: Influence of Carbon on the Stabilisation of Austenite in Fe-Cr-Ni Alloys (Vliyaniye ugleroda na stabilizatsiyu austenita v Fe-Cr-Ni splavakh)

PERIODICAL: Fizika Metallov i Metallovedeniye, 1958, Vol 6, Nr 5, pp 937 - 938 (USSR)

ABSTRACT: In earlier work (Ref 1) strong stabilisation of austenite in an alloy containing 0.05% C, 9.70% Cr and 13.73% Ni having an M_s point of -10 to 20 °C, was found to be brought about by isothermal soaking at 300, 400 and 500 °C. As the isothermal treatments were not accompanied by visible separation of the carbide phase, the suggestion was made that stabilisation and de-stabilisation are associated with internal re-arrangement of carbon in the austenite lattice (Ref 2). In order to check the influence of carbon on stabilisation, magnetometric specimens of 3 mm diameter, made of the same alloy, were exposed to a lengthy decarburisation treatment at 1 100 °C in hydrogen, followed by vacuum treatment (10^{-4} mm Hg col). After cooling the specimens in liquid nitrogen and

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Influence of Carbon on the Stabilisation of Austenite in Fe-Cr-Ni Alloys

re-heating to 1 100 °C, the M_s point of the decarburised alloy was found to be 180 to 190 °C. In order to investigate the stabilisation of austenite in the decarburised alloy at temperatures above the M_s point, the specimens were cooled in liquid nitrogen, then heated to 1 100 °C, held there for 20 min and transferred to a salt bath at 400, 500 and 600 °C, respectively, where they were held for various lengths of time from 1 to 24 hours. Subsequently, they were cooled to room temperature in a magnetometer. In Figure 1 martensite transformation curves are shown which were obtained for a specimen after soaking at 500 °C, side-by-side with the martensite curve of a specimen which had not been given isothermal treatment. Similar results were obtained after isothermal soaking at 400 and 600 °C. The martensite curves of specimens which were isothermally treated and those which were not, fully coincide, which points to the absence of any stabilisation as the result of soaking the gamma-phase at temperatures of 400, 500 and 600 °C. In the same alloy containing 0.05% C, stabilisation

Influence of Carbon on the Stabilisation of Austenite in Fe-Cr-Ni Alloys

of austenite as a result of direct and reverse martensite transformation (phase hardening), was also observed (Ref 1). However, stabilisation by phase work hardening, shown in Figure 2, is temporary and is due to a high M_s temperature of the decarburised alloy. On holding the stabilised specimens at room temperature, a strong isothermal transformation occurs, as a result of which the quantity of martensite increases and gradually approaches that of martensite obtained by isothermal soaking of an unstabilised specimen cooled from 1 100 °C (see Figure 3). The following conclusions are arrived at:
1) For the stabilisation of austenite by isothermal soaking above the M_s point the presence of carbon (nitrogen) in the alloy is essential. 2) For the stabilisation of austenite as a result of direct and reverse martensite transformation, the presence of carbon (nitrogen) is not essential.

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SOV/126-6-5-31/43

Influence of Carbon on the Stabilisation of Austenite in Fe-Cr-Ni Alloys

Acknowledgments are made to V.D. Sadovskiy for his advice. There are 3 figures and 3 references, 1 of which is Soviet, 1 English and 1 French.

ASSOCIATION: Institut fiziki metallov Ural'skogo filiala AN SSSR (Institute of Metal Physics, Ural Branch of AS USSR)

SUBMITTED: June 10, 1957

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SOV/137-59-4-8513

Translation from: Referativnyy zhurnal, Metallurgiya, 1959, Nr 4, p 168 (USSR)

AUTHORS: Malyshev, K.A., Borodina, N.A., Mirmel'shteyn, V.A.

TITLE: Strengthening of Metastable Austenitic Alloys by Means of Phase Hard-Facing

PERIODICAL: Tr. in-ta fiz. metallov. Ural'skiy fil. AS USSR, 1958, Nr 20, pp 339 - 348

ABSTRACT: The authors investigated strengthening of austenitic alloys by means of phase hard-facing, developing as a result of direct and reverse martensite transformation $\gamma \rightleftarrows \alpha$. The following alloys were investigated: Fe-Ni (27.8% Ni); Fe-Cr-Ni (C 0.05%, Mn 0.33%, Cr 9.7%, Ni 13.73%) and Fe-Mn-Cr-Ni (C 0.05%, Cr 5.1%, Mn 2.87 - 6.8%, Ni 9.72 - 14.69%). The following method of heat treatment for phase hard-facing was mainly used (one cycle): cooling below the martensite point T_m for the purpose of martensite formation; heating over $T'\alpha$ -, i.e. the final temperature of reverse martensite transformation $\alpha \rightleftarrows \gamma$, for the purpose of austenite formation, and cooling-off to room temperature. Phase hard-facing, consequently, was developing by means of double

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Strengthening of Metastable Austenite Alloys by Means of Phase Hard-Facing

$\gamma \rightleftarrows \alpha$ and $\alpha' \rightarrow \gamma$ transformation. The number of cycles varied between 1 to 8. As a result of a single transformation cycle of $\gamma \rightarrow \alpha + \gamma$, considerable increase of σ_s was observed; σ_b increased less whereas a_k decreased. An increased number of cycles leads to additional but small increase of σ_s. The degree of strengthening of the γ-phase is determined by the initial state of T_m and by the amount of martensite participating in reverse martensite transformation $\alpha \rightarrow \gamma$. Austenite strengthening due to phase hard-facing is connected with the refinement of the domain structure. Stabilization of the γ-phase, strengthened as a result of direct and reverse martensite transformation, is observed in Fe-Cr-Ni and in Fe-Mn-Cr-Ni alloys and does not take place in Fe-Ni alloys; this is explained by the different magnitude of stresses of second kind. The authors investigated the effect of higher C content in austenitic alloys on the magnitude of strengthening in phase hard-facing. The investigated alloys contain C (0.05%; chrome alloys contain also N. Redistribution of C and N in the γ-phase lattice during the heat process in reverse martensite transformation has a substantial effect on stabilization or destabilization of the γ-phase, as a result of direct and reverse martensite transformation. There are 9 bibliographical titles.

Card 2/2

V.G.

S/810/62/000/000/001/013

AUTHORS: Malyshev, K. A., Borodina, N. A., Gorbach, V. G.

TITLE: Phase-hardening as a method for the toughening of austenitic steels.

SOURCE: Metallovedeniye i termicheskaya obrabotka; materialy konferentsii po metallovedeniyu i termicheskoy obrabotke, sost. v g. Odesse v. 1960 g. Moscow, Metallurgizdat, 1962, 21-28.

TEXT: The paper proposes a new method for increasing the toughness of austenitic (A) steels (S), the so-called "phase hardening" (PhH), for A which upon direct and reverse martensitic transformation (MT) undergoes appreciable toughening. The paper also adduces experimental data. PhH consists in cold treatment at liquid-N temperature and subsequent short-term heating to 600-700°C. The new method overcomes the inadequacies of plastic deformation as a sole means of toughening of austenite which is limited in the type of parts to which it is applicable and which affects the magnetic properties of the metal. The new method also has advantages over strengthening by means of dispersion hardening which is accompanied by a sharp reduction in toughness and ductility. PhH is more accurately defined as a hardening or toughening produced during phase transformation in cooling or in heating. The initial cold treatment of a suitably selected austenitic steel from

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room temperature to sub-freezing temperatures brings about a MT, and subsequent heating produces the reverse transformation of M into A. In high-alloyed A steels the second transformation may occur at relatively low temperatures, not exceeding 400-600°C. If the solid solution contains alloying-element atoms of low mobility, the $\alpha \rightarrow \gamma$ transformation can proceed by a nondiffusional ordering mechanism, that is, reverse MT occurs in heating. The end result of the direct-reverse MT is a hardening (toughening) of the A. The transformation is schematically illustrated. The lab investigation comprised: (a) Fe-Ni (30% Ni), (b) A low-C alloys (0.05-0.07% C), and (c) A alloys with 0.4-0.6%C. The alloys were smelted in an HF furnace, cast into 30-kg ingots (homogenized at 1,150-1,200°C for 10-12 hrs), and were forged into rods from which specimens 3 mm diam, 50 mm long, were made for magnetometric (MM) tests, and billets 10x10x60 mm were prepared for mechanical tests. The MM specimens were heated twice in vacuum to 1,100° with an intermediate cooling to -196°C in liquid N. Uniform grain size was obtained in all alloys. Galvanometric determinations were made of the M point, the temperature of the end of the reverse $\alpha \rightarrow \gamma$ transformation during heating, and the relative amount of M upon cooling to liquid-N temperature (α, %). The PhH itself was accomplished by liquid-N cooling of the specimens to produce direct $\gamma \rightarrow \alpha$ MT and then heating them to 20-30° above the temperature of the end of the reverse transformation $\alpha \rightarrow \gamma$ and final cooling in water. Details of the PhH of Fe-Ni are

described, and the role of the amount of M that participates in the PhH is interpreted. Repeated direct-and-reverse cycles (up to 8) did not afford any substantial additional toughening. The effect of alloying elements on the toughening resulting from PhH is discussed. Cr, Mn, Si, and W additions did not produce any change in toughenability from that of the Fe-Ni alloy. Up to 0.4% C improved the hardening effect from 50-65 kg/mm^2. In summary, the degree of toughening of A alloys depends on the chemical composition, relative amount of M that participates in the direct and reverse MT, and the heating temperature during the reverse MT into A. Maximum toughening resulting from PhH corresponds approximately to the hardening obtained by plastic deformation "up to saturation." The process of PhH is interpreted as being due to a refinement of the block structure of the A. There are 7 figures and 5 references (3 Russian-language Soviet, 2 German).

ASSOCIATION: None given.

L 8857-66 EWT(m)/EWA(d)/T/EWP(t)/EWP(z)/EWP(b)/EWA(h)/EWA(c) JD

ACC NR: AP5026744 SOURCE CODE: UR/0286/65/000/017/0020/0020

INVENTOR: Malyshev, K. A.; Borodina, N. A.; Gorbach, V. G.

ORG: none

TITLE: Method of heat treatment of austenitic alloys. Class 18, No. 174203 [Announced by the Ural Branch of the Institute of Metal Physics, AN SSSR (Ural'skiy filial instituta fiziki metallov AN SSSR)]

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 17, 1965, 20

TOPIC TAGS: austenitic steel, metalaging, alloy, metal heat treatment, solid mechanical property

ABSTRACT: This Author Certificate introduces a method of heat treatment of austenitic alloys which combines direct gamma to alpha and reverse alpha to gamma transformations and produces strain-hardened austenite. Improved mechanical properties are obtained by subsequent aging of strain-hardened austenite while preserving the austenitic structure of the alloys.

[AZ]

SUB CODE: 13, 11 / SUBM DATE: 01Feb64/ ATD PRESS: 4152

BVK

Card 1/1 UDC: 621.785.797

BORODINA, N.A.

Methodology of phenological observations of plants of the Pinaceae family. Biul. Glav. bot. sada no.57:11-19 '65. (MIRA 18:9)

1. Glavnyy botanicheskiy sad AN SSSR.

ACC NR: AT6036275 SOURCE CODE: UR/0000/66/000/000/0026/0038

AUTHOR: Gorbach, V. G.; Malyshev, K. A.; Borodina, N. A.

ORG: Institute of Physics of Metals, AN UkrSSR (Institut metallofiziki AN UkrSSR); Institute of Physics of Metals, AN SSSR (Institut fiziki metallov AN SSSR)

TITLE: Using phase transfromation and age hardening for induced strengthening of austenitic alloys

SOURCE: AN UkrSSR. Struktura metallicheskikh splavov (Structure of metal alloys). Kiev, Izd-vo Naukova dumka, 1966, 26-28

TOPIC TAGS: austenite transformation, iron nickel alloy, titanium containing alloy, metal aging, metal property/ N27T alloy, N27T2 alloy, N27T3 alloy

ABSTRACT: The feasibility of strengthening austenitic iron-nickel-titanium alloys containing 27—29% nickel and 1.0—2.5% titanium by combining the effects of phase transformation and aging has been investigated. Phase transformation of alloys was achieved by refrigeration at -196C and reheating up to 800C, followed by cooling. This treatment produced $\gamma \rightarrow \alpha \rightarrow \gamma$ transformation, and increased the hardness of austenite to 225—265 HV, compared to 110—120 HV for the alloy after conventional treatment (annealing at 1100C followed by refrigeration). The hardness increased with increasing titanium content. Additional aging at 600C for four hr of the alloy

ACC NR: AT6036275

containing 0.95% and 2.06% titanium increased its hardness to 280 and 400 HV, respectively. An alloy with 2.5% titanium had a tensile strength of 150 kg/mm^2, yield strength of 105 kg/mm^2, an elongation of 10%, and a reduction of area of 18%, compared to 70 kg/mm^2, 58 kg/mm^2, 5% and 8% for the conventionally annealed alloys.

SUB CODE: 13/ SUBM DATE: 27May65/ ORIG REF: 012/ OTH REF: 002/ ATD PRESS: 5106

Card 2/2

BORODINA, N.A.; GORYAINOVA, A.V., kand.tekhn.nauk

Some practical characteristics of graphite heat exchangers. Zhur. VKHO 10 no.1:58-66 '65. (MIRA 18:3)

BORODINA, N.A.

Variability of the oak Quercus robur L. at the southeastern limit of its range. Nauch.dokl.vys.shkoly;biol.nauki no.3: 135-140 '58. (MIRA 11:12)

1. Predstavlena kafedroy darvinizma Moskovskogo gosudarstvennogo universiteta imeni M.V.Lomonosova.
(Kamyshin region--Oak) (Leaves--Morphology)

BORODINA, N.A.

Accelerated development of the English oak near the outer limits of its habitat. Biul.Glav. bot. sada no.39:78-82 '60.
(MIRA 14:5)

1. Glavnyy botanicheskiy sad AN SSSR.
(Oak)

NEKRASOV, V. I.; VARTAZAROVA, L. S.; BORODINA, N. A.

Occurrence of a monoclinous inflorescence in an introduced Japanese white birch. Bot. zhur. 48 no.3:436-440 Mr '63. (MIRA 16:4)

1. Glavnyy botanicheskiy sad AN SSSR, Moskva.

(Birch) (Inflorescence) (Abnormalities(Plants))

BORODINA, N.A.

Peculiarities of the growth of oak in Stalingrad Province.
Biul. Glav. bot. sada no.42:10-20 '61. (MIRA 17:3)

1. Glavnyy botanicheskiy sad AN SSSR.

BORODINA, N.A.; PLOTNIKOVA-VARTAZAROVA, L.S.; PETROVA, I.P.; CHEREMUSHKINA, E.I.; SHCHERBATSEVICH, V.D.

Special aspects of the wintering of plants in the arboretum of the Main Botanica Garden in 1960-1961. Biul. Glav. bot. sada no.51:12-23 '63. (MIRA 17:2)

1. Glavnyy botanicheskiy sad AN SSSR.

89901

S/078/61/006/003/006/022
B121/B208

21,3100

AUTHORS: Moiseyev, I. V., Borodina, N. N., Tsvetkova, V. T.

TITLE: Investigation of some physico-chemical properties of plutonium cupferronate

PERIODICAL: Zhurnal neorganicheskoy khimii, v. 6, no. 3, 1961, 543-548

TEXT: The authors studied the composition, solubility, and extraction of the reaction products of tri-, tetra-, and hexavalent plutonium with cupferron, since no data are available on their physico-chemical properties. The composition of the precipitate in the precipitation of plutonium with cupferron was always found to correspond to tetravalent plutonium, irrespective of the plutonium valence in the initial solution. The composition of plutonium(IV) cupferronate was determined by potentiometric titration of sulfuric acid solutions of tetravalent plutonium with cupferron solutions. When precipitating trivalent plutonium with cupferron, the latter is not consumed by oxidation, but the plutonium(III) ion is oxidized in the solution and then forms the stable complex compound $Pu(C_6H_5N_2O_2)_4$ in the presence of cupferron. Precipitation of tri-

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Investigation of some...

valent plutonium with cupferron takes place according to the following equation:

$$Pu_2(SO_4)_3 + 8\ C_6H_5N_2O_2NH_4 + H_2SO_4 = 2\ Pu(C_6H_5N_2O_2)_4 + 4\ (NH_4)_2SO_4 + H_2.$$

In the precipitation of hexavalent plutonium with cupferron in acid solutions, plutonium(VI) is reduced to plutonium(IV) which is precipitated as $Pu(C_6H_5N_2O_2)_4$. The solubility of plutonium cupferronate was determined by the method of I. V. Pyatnitskiy (Ref. 6):

$$K_p = \frac{[H^+]^4}{[Pu^{IV}][HR]^4} = 6.6 \cdot 10^{13}$$

$$L_p = [Pu^{IV}][R^-]^4 = 1.2 \cdot 10^{-31}.$$

It was found in numerous experiments that the precipitation of plutonium cupferronate from 1.5 - 3 M sulfuric acid solutions in the presence of 2.5 - 3.5 mg/ml of excess cupferron gives rise to a complete plutonium separation from equimolecular quantities of uranium, chromium, manganese, aluminum, silver, nickel, and lanthanum. Also a quantitative separation of plutonium from americium is achieved under equal conditions. The

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Investigation of some...

extraction of plutonium(IV) cupferronate from sulfuric acid solutions with chloroform was studied. The composition of the extractable complex is $Pu(C_6H_5N_2O_2)_4$. Extraction of trivalent plutonium by chloroform from sulfuric and nitric acid solutions in the presence of cupferron also takes place in the form of $Pu(C_6H_5N_2O_2)_4$. Plutonium(IV) cupferronate is less extracted with CCl_4 than with $CHCl_3$. At 20 ± 1°C, the following equation holds for the constant K_{eq} in the system PuR_4 - HR - $CHCl_3$:

$$K_{eq} = \frac{[PuR_4]_{CHCl_3}}{[Pu^{IV}]_{H_2O}} \cdot \frac{[H^+]^4}{[HR]^4_{CHCl_3}} = 1.1 \cdot 10^7.$$

There are 2 figures, 2 tables, and 8 references: 7 Soviet-bloc and 1 non-Soviet-bloc.

SUBMITTED: July 20, 1960

Card 3/3

KUZ'MIN, Petr Gavrilovich; FERRONSKIY, Vasiliy Ivanovich; DALMATOV, B.I., prof., doktor tekhn. nauk, retsenzent; BORODINA, N.N., red.; CHIZHEVSKIY, E.M., tekhn.red.

[Designing foundations for limiting states] Proektirovanie fundamentov po predel'nym sostoianiiam. n.p. Rosvuzizdat, 1963. 66 p. (MIRA 17:1)

1. Leningradskiy inzhenerno-stroitel'nyy institut (for Dalmatov).

IVANOVA, M.S.; BORODINA, N.N., red.; SHVETSOV, S.V., tekhn. red.

[Calculations for the selection of auxiliary equipment for a boiler unit] Raschety k podboru vspomogatel'nogo oborudovaniia kotel'noi ustanovki. Moskva, Rosvuzizdat, 1963. 69 p. (MIRA 16:12)
(Boilers--Design and construction)

SADETOV, S.Ya.; BYCHKOV, D.V., doktor tekhn.nauk, prof., retsenzent; BORODINA, N.N., red.; ZORINA, V.A., tekhn. red.

[Designing thin-walled rods of open profile] Raschet tonkostennykh sterzhnei otkrytogo profilia. [n.p.] Rosvuzizdat, 1963. 83 p. (MIRA 17:3)

1. Moskovskiy inzhenerno-stroitel'nyy institut (for Bychkov).

ITSKOVICH, G.M.; VINOKUROV, A.I.; Prinimal uchastiye:
MININ, L.S.; MAKUSHIN, V.M., laureat Leninskoy premii,
prof., retsenzent; SHPIRO, G.S., kand. tekhn.nauk, nauchn.
red.; BORODINA, N.N., red.; CHIZHEVSKIY, E.M., tekhn.red.

[Manual for solving problems on the strength of materials]
Rukovodstvo k resheniiu zadach po soprotivleniiu materialov.
Moskva, Rosvuzizdat, 1963. 351 p. (MIRA 16:8)
(Strength of materials--Problems, exercises, etc.)

RUBIN, M.V.; BORODINA, N.N., red.; BARANOV, Yu.V., tekhn. red.; SHVETSOV, S.V., tekhn. red.

[Manual for practical work on the strength of materials] Rukovodstvo k prakticheskim zaniatiam po soprotivleniiu materialov. 4. izd. Moskva, Rosvuzizdat, 1963. 488 p. (MIRA 16:10)

(Strength of materials—Handbooks, manuals, etc.)

KLEYN, Georgiy Konstantinovich; SIMVULIDI, I.A., prof., doktor tekhn. nauk,retsenzent; POL'SHIN, D.Ye., st. nauchn. sotr., kand. tekhn. nauk, retsenzent; BORODINA, N.N., red.

[Calculating retaining walls] Raschet podpornykh sten. Yaroslavl', Vysshaia shkola, 1964. 195 p. (MIRA 17:8)

ROTENBURG, Iosif Solomonovich, kand. tekhn. nauk, dots.; POLYAKOV, Mikhail Pavlovich, kand. tekhn. nauk, dots.; ZOLOTAREV, Nikolay Vasil'yevich, kand. tekhn. nauk, dots.; LAVROVSKIY, Vadim Aleksandrovich, inz.; DADENKOV, Yu.N., doktor tekhn. nauk, prof., retsenzent; BEGAM, L.G., kand. tekhn. nauk, retsenzent; BORODINA, N.N., red.

[Designing bridge crossings over large streams] Proektirovanie mostovykh perekhodov cherez bol'shie vodotoki. Moskva, Vysshaia shkola, 1965. 335 p. (MIRA 18:6)

1. Chlen-korrespondent AN Ukr.SSR (for Dadenkov). 2. Rukovoditel' laboratorii mostovoy gidravliki i gidrologii TSental'nogo nauchno-issledovatel'skogo instituta svyazi (for Begam).

VINNIKOV, Ya.A., BORODINA, N.P.

Materials on a morphological analysis of ocular movements. Probl. fiziol. opt. 12:394-397 '58 (MIRA 11:6)

1. Kafedra gistologii i embriologii Turkmenskogo gozudarstvennogo meditsinskogo instituta.
(EYE--MOVEMENTS)

VOROB'YEV, M.I., dotsent, kand.tekhn.nauk; BORODINA, N.P.

Making models of plastics based on epoxide resins. Izv.vys.ucheb. zav.; mashinostr. no.4:48-53 '60. (MIRA 14:4)

1. Moskovskoye vysshaye tekhnicheskoye uchilishche im. N.E. Baumana.

(Models and modelmaking) (Plastics—Molding)

PA 22/49T54

BORODINA, O. N.

USSR/Medicine -- Fungi, Poisonous Aug 48
Medicine -- Mushrooms

"Toxic Fungi," O. N. Borodina, 2½ pp

"Fel'dsher i Akusherka" No 8

Describes species of toxic fungi which can be mistaken for edible mushrooms, with five sketches.

22/49T54

1. ARTAMONOV, P. A.: LOSEVA, T. K.Engs BORODINA, O. O.

2. USSR (600)

4. Water Gas

7. Purifying water gas with a solution of mono-ethylamine. Masl. zhir. prom. 17 no. 9, 1952.

9. Monthly List of Russian Accessions, Library of Congress, February 1953, Unclassified.

BORODINA, O.O., inzh.; GAYTSKHOKI, N.I., inzh.; STERLIN, B.Ya., kand. tekhn. nauk.

Expediency of centralized production of catalysts. Masl.-zhir. prom. 24 no.3:15-17 '58. (MIRA 11:4)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut zhirov. (Oil industries) (Catalysts)

BORODINA, O.O.; PEREPELKIN, K.Ye.; BROY-KARRE, M.V.

Determination of sodium acetate and other alkaline impurities in polyvinyl alcohol. Khim.volok. no.6:59-60 '61. (MIRA 14:12)

1. Leningradskiy filial Vsesoyuznogo nauchno-issledovatel'skogo instituta iskusstvennogo volokna.
(Vinyl alcohol polymers)

PEREPELKIN, K.Ye.; BORODINA, O.O.; SHEMKOV, N.K.

Properties of polyvinyl alcohol used in the production of the "vinol" fiber. Khim.volok no.4:17-20 '62. (MIRA 15:8)

1. Leningradskiy filial Vsesoyuznogo nauchno-issledovatel'skogo instituta iskusstvennogo volokna (for Perepelkin, Borodina).
2. Leningradskiy zavod iskusstvennogo volokna (for Shemkov).
(Textile fibers, Synthetic) (Vinyl alcohol polymers)

ACCESSION NR: AP4009827 S/0191/64/000/001/0007/0011

AUTHORS: Borodina, O.O.; Perepelkin, K. Ye.

TITLE: Thermal stability of polyvinyl alcohol

SOURCE: Plasticheskiye massy*, no. 1, 1964, 7-11

TOPIC TAGS: polyvinyl alcohol, polyvinyl alcohol films, sodium acetate, thermal treatment, color variation, electrophotocolorimeter

ABSTRACT: The effects of the addition of sodium acetate on color variation and on the solubility of polyvinyl alcohol films during thermal treatment over a 120-220 C range were investigated. It was concluded that the presence of sodium acetate contributes to the cross-linking of macromolecules and the formation of insoluble products as were the variation in specific viscosity and degree of polymerization. Orig. art. has 6 figures, 3 tables.

ASSOCIATION: None

SUBMITTED: 00 DATE ACQ: 10Feb64 ENCL: 00

SUB CODE: MA, OH NO REF SOV: 003 OTHER: 005

Card 1/1

27674
S/041/61/013/003/007/010
B112/B125

13.2520

AUTHOR: Borodina, R. M.

TITLE: Solution of the equations of motion of the balanced gyroscope by the method of averaging

PERIODICAL: Ukrainskiy matematicheskiy zhurnal, v. 13, no. 3, 1961, 97-100

TEXT: Using a method by Krylov and Bogolyubov (N. N. Bogolyubov, Yu. A. Mitropol'skiy, Asimptoticheskiye metody v teorii nelineynykh kolebaniy, Fizmatgiz, 1958) the author solves the equations of motion of a free gyroscope in Cardan's suspension. According to Langrange, these equations read:

$$\frac{d}{dt}\left\{[A_1+(A'+A)\cos^2\beta+(C'+C)\sin^2\beta]\frac{d\alpha}{dt}+C\frac{d\varphi}{dt}\sin\beta\right\}=0,$$

$$\frac{d}{dt}\left[(B'+A)\frac{d\beta}{dt}\right]+\left(\frac{d\alpha}{dt}\right)^2(A'+A-C'-C)\sin\beta\cos\beta- \qquad (1),$$

Card 1/4

Solution of the equations of ...

$$-C\frac{d\alpha}{dt}\frac{d\varphi}{dt}\cos\beta = 0,$$

$$\frac{d}{dt}\left[C\frac{d\varphi}{dt} + C\frac{d\alpha}{dt}\sin\beta\right] = 0,$$

where α is the precession angle, β the nutation angle, γ the angle of revolution: A, B, C, A', B', C', A_1, B_1, C_1 are the moments of inertia of the rotor, of the outer and of the inner ring of the Cardan's suspension. The basic motion of such a gyroscope is a uniform revolution with constant precession and nutation. The solutions obtained here describe a perturbed basic motion. In first approximation they read

$$\beta = \bar{c}\cos(\omega_1 t + \bar{\theta}), \qquad (8),$$

$$\alpha = -\frac{H_0\bar{c}}{A_0\omega_1}\sin(\omega_1 t + \bar{\theta}) + \frac{1}{2}ea\bar{c}^2 t + c_1,$$

Card 2/4

Solution of the equations of ...

where $\bar{\vartheta} = \pi/2$, $\bar{c} = -\dot{\beta}_0/\omega_1$, $c_1 = -H_0\dot{\beta}_0/A_0\omega_1^2$, $\omega_1 = H_0/\sqrt{A_0\beta_0}$. H is the integral of the third equation of system (1). The second approximations are

$$\beta = \bar{c}\cos(\omega_1 t + \bar{\theta}) + \varepsilon\left[-\frac{1}{2}\frac{b\bar{c}^2}{\omega_1} + \frac{1}{6}\frac{b\bar{c}^2}{\omega_1}\cos 2(\omega_1 t + \bar{\theta})\right], \tag{11}$$

$$\alpha = -\frac{H_0\bar{c}}{A_0\omega_1}\sin(\omega_1 t + \bar{\theta}) + \varepsilon\left[\frac{a\bar{c}^2}{2\omega_1} - \frac{1}{3}\frac{H_0 b\bar{c}^2}{A_0\omega_1^2}\right]\sin 2(\omega_1 t + \bar{\theta}) + \bar{c}_2.$$

where $\bar{c}$, $\bar{c}_2$ and $\bar{\vartheta}$ are determined by the equations

$$\frac{d\bar{c}_2}{dt} = \frac{1}{2}\varepsilon a\bar{c}^2, \quad \frac{d\bar{c}}{dt} = 0, \quad \frac{d\bar{\theta}}{dt} = \varepsilon^2\left(\frac{3}{8}d\bar{c}^2 - \frac{5b^2}{12\omega_1}\bar{c}^2\right). \tag{10}$$

Card 3/4

Solution of the equations of ...

V. A. Pavlov (Vopr. prikl. girosk., 1, 1958) and D. S. Pel'por (NDVSh, Mashin. i pribor., 3, 1958) are mentioned. There are 6 references: 3 Soviet and 3 non-Soviet. The references to English-language publications read as follows: R. Goodstein, A perturbation solution of the euqations of motion of a gyroscope, J. Appl. Mech., ser. E, 26, 3, 1959. B. T. Plymale, R. Goodstein, Nutation of a Free Gyro Subjected to an Impulse, J. Appl. Mech., IX, 22, 3, 1955.

SUBMITTED: February 8, 1961, Kiyev

Card 4/4

BORODINA, R.M.

Some little-known ornamental plants of the steppe flora of the Crimea and their utilization in landscape gardening. Visnyk Bot.sada AN URSR no.4:84-90 '62. (MIRA 16:1)
(Crimea--Plants, Ornamental)

BORODINA, R.M.

Effect of a hysteresis motor on the stability of motion of a gyroscope in gimbals. Prikl. metod. resh. diff. urav. no.1: 11-18 '63 (MIRA 18:2)

BORODINA, R. Sh.

"Hemodynamic Changes in Certain Functional Deviations and Variants of the Development of the Cardiovascular System in Adolescents." Sub 28 Nov 51, Acad Med Sci USSR.

Dissertations presented for science and engineering degrees in Moscow during 1951.

SO: Sum. No. 480, 9 May 55.

L 8578-65 EWT(m)/EWP(q)/EWP(b) IJP(c)/ASD(m)-3/ASD(f) JD/WB/MLX 2

ACCESSION NR: AT4043087 S/0000/64/000/000/0440/0446

AUTHOR: Bogoyavlenskiy, A. F. (Doctor of chemical sciences, Professor); Borodina, S. A.

TITLE: Some peculiarities of the anodic behavior of titanium and its alloys in sulfuric-acid solutions 21

SOURCE: Mezhvuzovskaya konferentsiya po anodnoy zashchite metallov ot korrozii. 1st, Kazan, 1961. Anodnaya zashchita metallov (Anodic protection of metals); doklady* konferentsii. Moscow, Izd-vo Mashinostroyeniye, 1964, 440-446

TOPIC TAGS: titanium, VT1 titanium, VT5D titanium alloy, titanium anodizing, titanium alloy anodizing, oxidation film composition, oxidation film property, oxidation film 14

ABSTRACT: The effect of the applied voltage and time of anodizing on the properties and composition of films formed on VT-1 commercial-grade titanium and VT-5D titanium alloy (4.5—6% Al, 0.3 max% Fe, 0.15 max% Si, 0.05 max% each O, C, H, and N) has been investigated. Anodizing was carried out in a 20% sulfuric-acid electrolyte at 20C,

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ACCESSION NR: AT4043087

at a current density of 0.6 a/dm^2, and at a voltage of 5 to 60v. The maximum time of anodizing was 15 min. It was found that to each value of the anodizing voltage, a specific film color corresponded. With increasing voltage, the film thickness increased, e.g., from 0.3 to 1.7 μ for an applied voltage of 10 and 50v, respectively. Films formed at the same voltage were thicker on VT-5D alloy than were those on VT-1 titanium. Film thickness increased rather rapidly during the first 3—5 min, and then more slowly. The film appears to be a complex mixture of TiO, Ti_2O_3, and TiO_2 oxides, which is formed not only by simple superimposition of the oxide layers, but also by some interaction between them. Anodizing almost completely protected titanium against corrosion in a 100-hr test in 40% sulfuric acid at room temperature; it was, however, inadequate for protecting titanium in 78% sulfuric acid or in 10% hydrochloric acid. With an increasing voltage, the total amount of sulfate ions in the film increases, while their percent content decreases. This is probably because sulfate ions are adsorbed only by the outer layers of the film and do not penetrate the deeper layers. Orig. art. has: 4 figures and 2 tables.

ASSOCIATION: none

Card 2/ 3

L 8578-65

ACCESSION NR: AT4043087

0

SUBMITTED: 13Mar64 ATD PRESS: 3102 ENCL: 00

SUB CODE: MM, EM NO REF SOV: 009 OTHER: 008

Card 3/3

NEKRASOV, M.M., kand. tekhn. nauk; KLETCHENKOV, I.I., kand. tekhn. nauk; BORODINA, S.A.

Tunnel transistors. Avtom. i prib. no.3:13-16 Jl-S '64. (MIRA 18:3)

BORODINA, S. V.

Category : USSR/Radiophysics - Radio-wave propagation. Ionosphere I-6

Abs Jour : Ref Zhur - Fizika, No 1, 1957, No 1905

Author : Al'pert, Ya.D., Borodina, S.V.
Title : Investigation of the Propagation of Long and Superlong Radio Waves using analysis of the Shapes of the Atmospherics

Orig Pub : Radiotekhn. i elektronika, 1956, 1, No 3, 293-308

Abstract : Description of a method which yields data on the propagation properties of low-frequency electromagnetic waves from data on the total harmonic analysis of a photo-oscillogram of single atmospherics, excited by lightning discharges. A brief description is given of the experimental setup, of results of its tests, and of certain measurements. General characteristics of the shapes of the atmospherics and of the results of the analysis of a single atmospheric are given. It is shown that the data obtained on the dependence of the relative amplitude and of the average speed on the frequency, and on the distance are generally in good agreement with the results of the theoretical calculations.

(See also: BORODIN, S.V.

Card : 1/1

Sci Res Inst. Terrestrial Magnetism

BORODINA, S.V.

3(6) PHASE I BOOK EXPLOITATION SOV/1934

Leningrad. Nauchno-issledovatel'skiy institut zemnogo magnetizma, ionosfery i rasprostraneniya radiovoln

Trudy, Vyp. 13. (Transactions of the Institute of Scientific Research on Terrestrial Magnetism, the Ionosphere, and Radio Wave Propagation. Nr. 13) Moscow, Gidrometeoizdat (Otd-nie), 1957. 118 p. 1,120 copies printed.

Additional Sponsoring Agency: USSR. Ministerstvo svyazi.

Ed. (Title page): Ya.L. Al'pert; Ed. (Inside book): V.I. Tarkhunova; Tech. Ed.: V.V. Mayorov.

PURPOSE: This issue of the Institute's Transactions is intended for geophysicists and technical personnel working in research organizations as well as for advanced students at universities and technical vuzes. It is also of interest to communications personnel.

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COVERAGE: This publication contains six articles on aspects of radio wave propagation. Two articles by Ya.I. Likhter treat questions dealing with atmospheric noise and interference. Articles by S.V. Borodina and G.B. Lopatina deal with long-wave radio wave propagation. All articles include diagrams, figures, tables, and references.

TABLE OF CONTENTS:

AVAILABLE: Library of Congress

MM/lsb
6-22-59

Card 3/3

BORODINA, S. V.

56-5-42/46

AUTHOR: Al'pert, Ya.L., Borodina, S.V.

TITLE: On the Propagation Velocity of Electromagnetic Waves With Sound Frequencies (O skorosti rasprostraneniya elektromagnitnykh voln zvukovoy chastoty)

PERIODICAL: Zhurnal Eksperim. i Teoret.Fiziki, 1957, Vol. 33, Nr 5, pp. 1305-1307 (USSR)

ABSTRACT: The propagation velocity of electromagnetic waves, the frequencies of which are between 10^4 and 10 cycles, was investigated under real conditions.
The method of the total harmonic analysis of the photooscillogram of individual atmospheric recordings was applied, which were carried out at different distances from the source (spark discharge) and at different times of the year between 9 and 17.00 o'clock local time.
From the values obtained the corresponding curves were plotted, which, at every frequency, show a maximum which corresponds to the value $\bar{v}/c$.
The following was measured:

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56-5-42/46

On the Propagation Velocity of Electromagnetic Waves With Sound Frequencies

f (megacycles)	1,5-2,5	3-3,5	4-4,5	5 - 6	7 - 9	9 - 14	16 - 20
$\bar{v}/c$	1,09	1,05	1.024	1,014	1,006	1,004	1,002

There are 2 figures, 1 table, and 3 Slavic references.

ASSOCIATION: Institute for Terrestrial Magnetism, Ionosphere, and Propagation of Radiowaves (Institut zemnogo magnetizma, ionosfery i rasprostraneniya radiovoln)

SUBMITTED: August 3, 1957

AVAILABLE: Library of Congress

Card 2/2

SOV/109-59-4-2-6/27

AUTHORS: Al'pert, Ya.L., and Borodina, S.V.

TITLE: Propagation Velocity of the Audio-Frequency Electromagnetic Waves (O skorosti rasprostraneniya elektromagnitnykh voln zvukovoy chastoty)

PERIODICAL: Radiotekhnika i Elektronika, 1959, Vol 4, Nr 2, pp 195-201 (USSR)

ABSTRACT: The work describes some results of the measurement of the mean phase velocity $\overline{v}$ of the electromagnetic waves at frequencies ranging from 1 to 20 kc/s. The measurements were made by recording the atmospheric lightning discharges E(t) by means of a receiver. These recordings were subjected to a harmonic analysis, as proposed by the authors in an earlier work (Ref.9). From this it was possible to estimate the phase velocity of the waves. The measuring receiver was terminated with an oscilloscope, which was furnished with a triggered time base. When a signal appeared at the input of the receiver, the time base of the oscilloscope was released, the receiver was blocked and, therefore, made insensitive to further signals. Apart from recording the shape of the incoming signal, the co-ordinates of the signal

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Propagation Velocity of the Audio-Frequency Electromagnetic Waves

source were also measured, so that the distance r between the lightning and the receiver was known. The phase velocity of the waves could be evaluated by employing:

$$\bar{v}(\omega,r) = \frac{c}{1-\frac{\varphi(\omega,r)-\varphi_0(\omega,0)}{\omega}\frac{c}{r}} \qquad (6)$$

where c denotes the velocity of light, ω is the angular frequency, $\varphi(\omega,r)$ is the phase of the received signal and $\varphi_0(\omega,o)$ is the phase of the signal at the source. The functions φ and φ_0 could be evaluated by analysing the shape of the received signals (see Fig 1a). From the analysis, it was found that the phase velocity at audio-frequency is greater than the velocity of the electromagnetic waves in free space; in particular, at frequencies in the vicinity of 2 kc/s, the phase velocity is about 10% greater than c (see the values in Table 1 on page 200). In the near future it is intended to measure the phase velocities at frequencies of the

Propagation Velocity of the Audio-Frequency Electromagnetic Waves

order of tens c/s. The experimental results were compared with the theory (Ref 9) and were found to be in good agreement with it. There are 3 figures, two tables and 10 references of which 4 are Soviet, 5 English and 1 French.

ASSOCIATION: N.-I. In-t Zemnogo Magnetizma, Ionosfery i Rasprostraneniya Radiovoln (Scientific Research Institute of the Earth Magnetism, Ionosphere and Radiowave Propagation)

SUBMITTED: 14th August, 1957

Card 3/3

S/570/60/000/017/001/012
E032/E114

9.9000

AUTHOR: Borodina, S.V.

TITLE: Analysis of the forms of atmospherics

SOURCE: Akademiya nauk SSSR. Institut zemnogo magnetizma, ionosfery i rasprostraneniya radiovoln. Trudy. no.17(27). Moscow, 1960. Rasprostraneniye radiovoln i ionosfera. 3-26.

B

TEXT: In a series of previous papers the present author and Ya.L. Al'pert (Ref.1: Radiotekhnika i elektronika, v.1, no.3, 1956, Ref.2: Ya.L. Al'pert, Usp. fizich. nauk, v.60, 370, 1956, Ref.4: ZhETF no.11, 1957; Radiotekhnika i elektronika, v.4, 195, 1959) gave brief accounts of the results obtained at IZMIRAN as a result of analyses of the forms of single atmospherics. The present paper gives a more detailed account of these results. It is pointed out that so far only a small fraction of the accumulated experimental material has been analysed. This is due to the fact that the method of harmonic analysis (Ref.3: S.B. Borodina, Trudy NIZMIR, no.13, 1957) is rather laborious. Steps are being taken to speed up the analysis. A brief review

of the method is given in the first Section. It is shown how the analysis of the forms of atmospherics provided information about the effect of the medium on the propagation of electromagnetic waves and their velocity. Moreover, comparison of the results of such analyses with theoretical calculations can be used to determine the effective parameters of the lower ionosphere. The method was described in detail in Refs. 1 and 2 and is equivalent to a Fourier analysis of the atmospherics. The second Section gives a summary of this type of analysis as applied to atmospherics whose sources lie at 500-3300 km from the point of observation. The average amplitude of the spectra of atmospherics is plotted and tabulated as a function of frequency (in the range 1-30 kc/sec). Similar data are reproduced for the median amplitudes. It is shown that the spectrum of atmospherics usually has a maximum in the region 5-7 kc/s, and as the distance of the source increases, the position of the maximum moves towards higher frequencies. It is noticeable that there is also an amplitude minimum at about 3 kc/s. This Section also includes graphs and tables showing the results of analysis of the phase spectra of atmospherics.

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Analysis of the forms of atmospherics

S/570/60/000/017/001/012
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It is reported that in all cases there is good general agreement with the theory put forward by Ya.L. Al'pert (Ref.6: The propagation of low frequency electromagnetic waves over the earth's surface. M., Izd-vo AN SSSR, 1955). The experimental results are then used to obtain the ratio of the electron concentration to the collision frequency as a function of frequency in the range 2-20 kc/s. Acknowledgments are expressed to Ya.L. Al'pert who directed this work, to D.S. Fligel' for advice and to V.A. Yevteyeva and G.M. Melikhova for calculations.
There are 11 figures, 15 tables and 7 Soviet-bloc references.

Card 3/3

30934

9.9000
6.4100

S/570/60/000/017/004/012
E032/E114

AUTHORS: Borodina, S.V., Kalinin, Yu.K., Mikhaylova, G.A., and Fligel', D.S.

TITLE: A review of the present state of research into the propagation of ultra-long electromagnetic waves

SOURCE: Akademiya nauk SSSR. Institut zemnogo magnetizma, ionosfery i rasprostraneniya radiovoln. Trudy, no.17(27). Moscow, 1960. Rasprostraneniye radiovoln i ionosfera. 130-172

TEXT: Long and ultra-long electromagnetic waves are defined as those with wavelengths between 3 - 5 and some tens of thousands of kilometres. Part I of this paper is concerned with a review of the theory of propagation of ultra-long radio waves, beginning with G.N. Watson's paper (Ref.1: The transmission of electric waves round the earth. Proc. Roy. Soc., v.95, 546, 1919). It is indicated how the various equations formulated to describe the propagation of electromagnetic waves in the earth—uniform-ionospheric wave-guide can be evaluated. This is followed by a summary of the methods which can be used to take into account the

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A review of the present state of ...

finite conductivity and the spherical shape of the earth. A review is then given of attempts at the synthesis of atmospherics, among them the theories of Fligel' (present Symposium, 27-49) and J.R. Wait (Ref.18: The propagation on very low frequencies to great distances. NBS Report v.5513, September 3, 1957).
Part II is concerned with the experimental studies of the propagation of long and ultra-long radio waves. Experimental work on the amplitude and phase of these waves as functions of distance and time is summarised. Direct measurements of the field-strength and the diurnal variations in the propagation of the GBR signal are reviewed. An account is also given of the results obtained by indirect methods, e.g. lightning discharges, analysis of the spectrum of atmospherics by the tuned receiver method and studies of the tails of atmospherics. It is concluded that the experimental study of the propagation of long and ultra-long radio waves has confirmed the basic idea of the wave-guide theory of propagation. Direct measurement of the field-strength at 3000 km from the source showed that interference effects are present up to r = 1000-2000 km and are due to the large number of modes taking

A review of the present state of ...

part in the propagation. As the distance increases some of the modes are attenuated and the field amplitude falls off exponentially but remains relatively large. Direct measurements of the frequency stability of the GBR signal showed that the daytime stability at r = 5000 km is 10^{-9} over a period of several months and 10^{-10} over a day or two. At the antipodes, the frequency stability is of the order of 10^{-9} per hour. Indirect measurements confirm the results of direct field measurements but in a wider frequency range, namely, 500 cps - 50 kc/s. Analysis of the waveform of atmospherics showed that the wave-guide formed by the earth and the finite-conductivity ionosphere has certain selective properties. At 7 - 15 kc/s and 100-200 c.p.s. there is energy transmission with minimum attenuation. At 2 - 3 kc/s there is maximum absorption. The attenuation at 10 kc/s is greater by 10 db than at 2 - 3 kc/s. The ratio of the maxima in the spectrum of atmospherics on 10 kc/s and 100 c.p.s. varies with distance. At 500 km the maximum on 10 kc/s is 20 - 30% larger than on 100 c.p.s., while at 2000 km this difference disappears altogether. The signal level on 7 - 15 kc/s is subject to appreciable diurnal

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and seasonal variations. During daytime the signal level is lower than at night; during summer it is higher than in winter. The spectral region 40 - 200 c.p.s. exhibits small diurnal variations showing good propagation conditions both during daytime and at night. However, it appears that the difficulties encountered in the design of transmitting antennas on these frequencies cannot be overcome. The phase velocity in the frequency range 1 - 20 kc/s varies irregularly in the neighbourhood of c. In the frequency range 10 - 20 kc/s, the average phase velocity is practically independent of frequency and differs from c by fractions of a percent. As the frequency is reduced the phase velocity becomes appreciably greater than c, for example, at 2 kc/s the phase velocity differs by 10% from c. As the distance is increased from 1000 to 3000 km, the differences from c are appreciably reduced and are equal to a few tenths of a percent. The effective parameters of the lower ionosphere have been determined for larger distances where the zero mode predominates. The experimental values obtained for the ratio of the electron concentration to the collision frequency are found to be in good agreement with the theory of Ya.L. Al'pert and S.V. Borodina (Ref.19: present

Symposium, 3-26) right down to 3 - 4 kc/s. Thus, direct and indirect studies have shown the propagation of ultra-long radio waves to distances of 3000 to 5000 km as relatively stable during daytime but somewhat less stable at night. The propagation of radio waves with frequencies below 1 kc/s has not as yet been adequately studied either theoretically or experimentally. Direct measurements of the phase velocity as a function of distance and of the effect of the earth's magnetic field on the propagation of ultra-long radio waves is of major practical interest. It is stated that there are no published results in this field.

Acknowledgments are expressed to Ya.L. Al'pert for advice and to Yu.G. Ishchuk and G.M. Sosnovskaya for assistance during the writing of this paper.

There are 23 figures, 5 tables and 107 references: 10 Soviet-bloc, 1 Russian translation from a non-Soviet-bloc publication, and 96 non-Soviet-bloc. The four most recent English language references read as follows:

Ref.71: A.D. Watt, B.L. Maxwell. Observations on some low-frequency propagation paths in arctic areas. Trans. IRE v.AP-6, no.3, 308, 1958.

30934
S/570/60/000/017/004/012
E032/E114

A review of the present state of ...

Ref.81: J. Tantry. Automatic atmospherics-waveform recorder. Indian J. Phys., v.32, 367, 1958.
Ref.84: J. Chapman. The waveforms of atmospherics and the propagation of very low frequency radio waves. J. Atm. Terr. Phys., v.11, no.3/4, 223, 1957.
Ref.101: F. Hepburn. Atmospherics with very low frequency components below 1 kc/s. J. Atm. Terr. Phys., v.10, 266, 1957.

4

Card 6/6

69410

9,9100

S/141/60/003/01/001/020
E032/E414

AUTHORS: Borodina, S.V., Kalinin, Yu.K., Mikhaylova, G.A. and ~~Fligel', D.S.~~

TITLE: A Review of the Present State of Research into the Propagation of Very Low Frequency Electromagnetic Waves

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiofizika, 1960, Vol 3, Nr 1, pp 5-32 (USSR)

ABSTRACT: This is a review paper treating both theoretical and experimental problems. In the first part a review is given of calculations on the propagation of electromagnetic waves taking into account irregularities in the ionosphere, the finite conductivity and the spheroidicity of the earth. In the second part a review is given of experimental studies in the frequency range 10 cps to 50 Kc/s. Above 3 Kc/s there is good agreement between experimental and theoretical data. It is pointed out that it is necessary to develop a general theory of propagation of very low frequency electromagnetic waves taking into account both the spheroidicity and the finite

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A Review of the Present State of Research into the Propagation of Very Low Frequency Electromagnetic Waves

conductivity of the earth, particularly above 3 kc/s. The review is based on 109 published papers. Acknowledgement is made to Ya.L.Al'pert, Yu.G.Ishchuk and G.M.Sosnovskaya for their help. There are 14 figures, and 2 tables and 109 references, 11 of which are Soviet and 98 Western.

ASSOCIATION: Institut zemnogo magnetizma, ionosfery i rasprostraneniya radiovoln AN SSSR (Institute of Terrestial Magnetism, Ionosphere and the Propagation of Radio Waves, AS USSR)

SUBMITTED: September 19, 1959

Card 2/2

FANDEYEV, L.I., dotsent; BORODINA, S.Z.

Occupational dermatoses caused by sexivalent chromium in workers of a machine construction plant. Vest.derm.i ven. no.8:26-30 '61. (MIRA 15:5)

(SKIN--DISEASES) (CHROMIUM--TOXICOLOGY)

BORODINA, T., kand. sel'skokhoz. nauk, starshiy nauchnyy sotrudnik

Kazakhstan has introduced it, the Ukraine has not. Why?
Grazhd. av. 21 no.6:24 Je '64. (MIRA 17:8)

1. Gosudarstvennyy nauchno-issledovatel'skiy institut Grazhdanskogo vozdushnogo flota.

BORODINA, T. A.

Borodina, T. A.

"Age susceptibility of experimental animals to the virus of Japanese encephalitis." Acad Med Sci USSR. Moscow, 1955. (Dissertation for the Degree of Candidate in Medical Science)

So: Knizhnaya letopis', No. 25, 1956

BORODINA, T.A.

Some features of methods for working with newborn and young laboratory animals. Vop.virus. 1 no.5:51-55 S-O '56. (MLRA 10:1)

1. Laboratoriya entsefalitov Instituta virusologii imeni D.I. Ivanovskogo AMN SSSR, Moskva.
(VIRUS DISEASES, experimental,
method of working with newborn & young laboratory animals (Rus))

USSR / Morphology of Man and Animals. Nervous System. S-1

Abs Jour : Ref Zhur - Biol., No 5, 1958, No 21659

Author : Borodina, T. A.
Inst : Not given
Title : On Localization of Gnostic Functions in the Right Cerebral Hemisphere.

Orig Pub : Sb. nauchn. rabot vrachey Penzensk. obl. bol'nitsy, 1957, No 2, 146-148.

Abstract : No abstract.

Card 1/1

USSR/Virology - Viruses of Man and Animals. E
Viruses of Transmittable Infections.

Abs Jour : Ref Zhur Biol., No 6, 1959, 23810

Author : Borodina, T.A.
Inst : -
Title : The Clinical Picture of Japanese Encephalitis in White Mice of Various Age Groups.

Orig Pub : Vopr. virusologii, 1958, No 2, 106-107

Abstract : White mice at ages of 2-,7-,14- and 30 days were infected with a 10% suspension of the brain of infected mice. In 14- and 30-day-old mice, the same clinical picture developed as in adult animals. In mice of 2- and 7-day age groups, independently of the means of virus introduction, decrease of activity, loss of weight, increased sensitivity to outside stimulants, paralysis of back and neck muscles, and weakness of extremities were observed. The paralyses of extremities did not develop.

Card 1/2

USSR/Virology - Viruses of Man and Animals. E
Viruses of Transmittable Infections.

Abs Jour : Ref Zhur Biol., No 6, 1959, 23810

In all mice, a decrease of the amount of respiratory movements (especially expressed in 2-,7- and 14-day old animals) was noted, as well as of cardiac contractions.
-- G.D. Zasukhina

Card 2/2

TIKHONENKO, T.I.; BORODINA, T.A.

Composition and content of nucleic acids in the brain of white mice infected by Japanese B and tick-borne encephalitis viruses. Acta virol. Engl. Ed., Praha 2 no.3:152-157 July-Sept 58.

1. Ivanovsky Institute of Virology, U. S. S. R. Academy of Medical Sciences, Moscow.

(BRAIN, metabolism
nucleic acid composition & content in exper. virus encephalitis in mice)
(ENCEPHALITIS, JAPANESE B, experimental
eff. on nucleic acid composition & content in brain of infected mice)
(ENCEPHALITIS, EPIDEMIC, experimental
tick-borne encephalitis in mice, eff. on nucleic acid composition & content of brain)
(NUCLEIC ACIDS, metabolism
composition & content in brain of mice with exper. Japanese B encephalitis & tick-borne encephalitis)

BORODINA, T.A.

Clinical picture of Japanese encephalitis in white mice at various ages. Vop. virus 3 no.2:106-107 Mr-Ap '58 (MIRA 11:5)

1. Laboratoriya entsefalitov Instituta virusologii imeni D.I. Ivanovskogo AMN SSSR, Moskva.
(ENCEPALITIS, JAPANESE B, experimental clin. pathol. in mice (Rus))

BORODINA, T.A.

Studies on virusemia in experimental rabies. Vop.virus. 4 no.2:222-225 Mr-Ap '59. (MIRA 12:6)

1. Laboratoriya patogeneza i patomorfologii virusnykh infektsiy Instituta virusologii imeni D.I.Ivanovskogo AMN SSSR, Moskva.
(RABIES, exper.
virusemia (Rus))

BORODINA, T.A.

Keratogenic properties of tick-borne encephalitis virus. Vop. virus. 9 no.3:354-357 My-Je '64. (MIRA 18:1)

1. Institut virusologii imeni D.I. Ivanovskogo AMN SSSR, Moskva.

BORODINA, T.P., kand.sel'skokhoz.nauk

First International Conference on Agricultural Research.
Zemledelie 7 no.7:95 Jl '59. (MIRA 12:9)
(Rome--Agricultural research--Congresses)

31* (Above-Ground Nourishment of the Sugar Beet.) Vnekornevaia podkormka sakharnoi svekly. I. V. Iakushkin and T. R. Borodina. *Dostizheniia Nauki i Peredovogo Opyta v Selskom Khoziaistve*, 1954, no. 8, Aug., p. 32-37.

Airplane spraying with KCl neutralized double superphosphate and potassium-ammonium-phosphate. Tables, photographs.

BORODINA, T.R., Cand Agr Sci -- (diss) "Peculiarities of the aviation method of extraradical preharvest feed of sugar beet." Mos, 1958, 16 pp (Mos Order of Lenin Agr Acad im K.A. Timiryazev) 110 copies (KL, 23-58, 108)

BORODINA, T.R.; POKROVSKIY, V.Ye.

Chemical weed control from the airplane. Zashch. rast. ot vred. i bol. 6 no.5:34-35 My '61. (MIRA 15:6)

1. Gosudarstvennyy nauchno-issledovatel'skiy institut Grazhdanskogo vozdushnogo flota.
(Weed control)

BORODINA, T.R., kand.sel'skokhoz.nauk

Use herbicide mixtures. Zashch. rast. ot vred. i bol. 8 no.2: 36-37 F '63. (MIRA 16:7)

1. Gosudarstvennyy nauchno-issledovatel'skiy institut Grazhdanskogo vozdushnogo flota.
(Virgin Territory--Weed control)

PODOPRIGORA, V.S., kand.biolog. nauk; BORODINA, T.R., kand.sel'skokhoz. nauk

Air-borne spraying of hervicides before sowing. Zashch. rast. ot vred. i bol. 9 no. 4:19 '64. (MIRA 17:5)